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(54) Arrangement structure of upper cowl, screen, and meter for motorcycles

(57) In a motorcycle, to increase the wedge effect of the upper cowl with respect to the wind buffeted thereto during travel and reduce wind drag while maintaining continuity of the upper surface of the screen with respect to the upper surface of the head of the rider in a fully bent posture, and to provide a meter with high visibility even for the rider in a fully bent posture.

In a motor cycle constructed in such a manner that the upper surface of the upper cowl 11 for covering the upper end portion of the front fork 1 is formed into a convex surface 11a with a backward rising gradient, a screen 21 having an upper surface formed into a convex shape21a with a backward rising gradient is mounted on the upper cowl around the periphery of the open-rear notch 20 for mounting the screen, and a meter 25 is disposed inside the upper cowl 11 and the screen 21, the backward rising gradient α of the upper surface of the upper cowl 11 at the rear edge is determined to be smaller than the backward rising gradient β of the upper surface of the screen 21 at the front edge, and the display surface 25a of the meter 25 is disposed vertically across the boundary B between the upper cowl 11 and the screen 21 in side view.

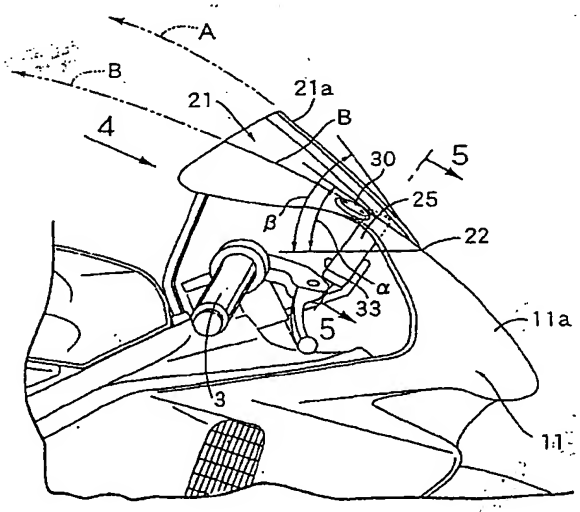

FIG. 3

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Description

[0001] The present invention relates to an arrangement structure of upper cowl, screen, and meter suitable for the sport-type motorcycles, and more specifically, to an improvement of an arrangement structure of upper cowl, screen, and meter for motorcycles in which the upper surface of the upper cowl for covering the upper end portion of the front fork that supports the steering handle is formed into a convex surface with a backward rising gradient, a screen having an upper surface formed into a convex shape with a backward rising gradient is mounted on the upper cowl around the periphery of the open-rear notch for mounting the screen, and a meter having a display surface facing in the upper rear direction for being mounted on the vehicle body frame is disposed on the inner side of the upper cowl and the screen.

[0002] Such an arrangement structure of upper cowl, screen, and meter for motorcycles is already known as disclosed, for example, in Japanese Utility Model Laid-Open No.32983/1988.

[0003] In the motorcycles of the related art, since the upper surfaces of the upper cowl and the screen formed a continuous convex surface, the entire upper surface of the upper cowl and the screen had a relatively steep backward rising gradient in order to continuate the upper surface of the screen and the upper surface of the head of the rider in the fully bent posture. The meter was disposed within the range of the upper cowl.

[0004] However, when the entire upper surface of the upper cowl and the screen is given a steep backward rising gradient as described above, the wedge effect of the upper cowl with respect to the wind buffeted thereon during travel decreases, thereby increasing wind drag.

[0005] With such circumstances in view, it is an object of the present invention to provide an arrangement structure of front cowl, screen, and meter for motorcycles in which the wedge effect of the upper cowl with respect to the wind buffeted thereon during travel increases and thus wind drag is reduced while maintaining continuity of the upper surface of the screen with respect to the upper surface of the head of the rider in the fully bent posture, and the meter is positioned so that the rider in the fully bent posture can easily view.

[0006] In order to achieve the aforementioned object, the present invention provides an arrangement structure of upper cowl, screen and meter for motorcycles, in which the upper surface of the upper cowl for covering the upper end portion of the front fork that supports the steering handle is formed into a convex surface with a backward rising gradient, a screen having an upper surface formed into a convex shape with a backward rising gradient is mounted on the upper cowl around the periphery of the open-rear notch for mounting the screen, and a meter having a display surface facing toward the back, upper side for being mounted on the vehicle body frame is disposed inside the upper cowl and the screen, characterized in that the backward rising gradient of the upper surface of the upper cowl at the rear edge having the notch is determined to be smaller than the backward rising gradient of the upper surface of the screen at the front edge, and the display surface of the meter is disposed vertically across the boundary between the upper cowl and the screen in side view.

[0007] According to this characteristic, when the rider is fully bent down and place his head near the rear edge of the screen during travel of the motorcycle, the upper cowl having a convex upper surface with a relatively gentle backward rising gradient preferably creates the wedge effect with respect to the wind buffeted thereon during travel and thus contributes to reduce wind drag. Since the convex upper surface of the screen having a relatively steep backward rising gradient has continuity with respect to the upper surface of the head of the rider, the wind streaming rearward along the upper surface of the screen is transferred to the upper surface of the head of the rider smoothly, which also contributes to reduction of wind drag. Therefore, wind drag of the entire motorcycle including a rider is effectively reduced, and thus the maximum vehicle speed may be increased. In addition, the display surface of the meter disposed vertically across the boundary between the upper cowl and the screen in side view can easily be viewed by the rider in fully bent posture, and thus visibility thereof is satisfactory.

[0008] The second characteristic of the present invention is, in addition to the first characteristic, that the meter comprises a trapezoidal portion the lateral width of which decreases toward the front, and the meter is disposed in such a manner that at least a part of the trapezoidal portion is positioned in an arcuate space enclosed by the inner surface of the screen and the straight line passing between the left and right ends of the inner surface.

[0009] According to the second characteristic, even when a relatively large meter with high visibility is employed, it can be disposed near the inner surface of the screen, and a space for allowing the rotation of a top bridge of the front fork can easily be defined between the meter and the top bridge of the front fork.

[0010] Referring now to the attached drawings, one embodiment of the present invention will be described.

Fig. 1 is a side view of the motorcycle according to the present invention.
Fig. 2 is a front view of the same motorcycle.
Fig. 3 is a partially enlarged view of Fig. 1.
Fig. 4 is a drawing viewed in the direction illustrated by the arrow 4 in Fig. 3.
Fig. 5 is a cross sectional view taken along the line 5-5 in Fig. 3.

[0011] Referring now to Fig. 1 and Fig. 2, a front fork 1 for rotatably supporting the front wheel 2f is connected to the front end of the vehicle body frame of the motor-

cycle M so as to be capable of steering, and a steering handle 3 is mounted on the upper end portion of the front fork 1. A rear fork 4 for rotatably supporting the rear wheel 2r is attached to the rear end portion of the vehicle body frame so as to be capable of pivotal movement in the vertical direction, an engine 5 for driving the rear wheel 2r is mounted on the central portion of the vehicle body frame, above which a seat 6 on which the rider R straddles is disposed.

[0012] In addition, a front cowl 10 is mounted on the vehicle body frame. The front cowl 10 comprises an upper cowl 11 for covering the upper end portion of the front fork 1 from the front, and a lower cowl 12 connected to the lower end of the upper cowl 11 and covering the left and right sides of the area from the center portion of the front fork 1 to the engine 5.

[0013] A cooling air inlet 13 is disposed between the upper cowl 11 and the lower cowl 12, and a cooling air discharge port 14 to which the radiator 15 of the engine 5 is facing is disposed between the left and right side walls of the lower cowl 12, so that air introduced into the cooling air inlet 13 cools the radiator 15 down and is discharged from the cooling air discharge port 14.

[0014] The engine 5 is attached with an engine undercover 16 for covering the under surface thereof and forming a cooling air passage 17 with respect to the lower surface of the engine 5.

[0015] As shown in Fig. 1 to Fig. 3, the upper surface of the upper cowl 11 is formed into a convex surface 11a with a backward rising gradient. The upper cowl 11 is formed with a V-shaped, or U-shaped open-front notch 20 for mounting the screen, a transparent screen 21 is mounted around the periphery of the notch 20, and the upper surface of the screen 21 is also formed into a convex surface 21a with a backward rising gradient.

[0016] Especially, the backward rising gradient of the convex surface 11a forming the upper surface of the upper cowl 11 is determined to be as gentle as possible in order to increase the wedge effect of the upper cowl 11 with respect to the wind buffeted thereon during travel. On the other hand, the backward rising gradient of the convex surface 21a forming the upper surface of the screen 21 is determined to be relatively steep in order to continuate the convex surface 21a and the upper surface of a helmet H when the rider R takes a fully bent posture in which his upper body is bent to the almost horizontal position to bring the helmet H on his head closer to the rear edge of the screen 21 (See Fig. 1). As a consequent, the backward rising gradient α of the upper surface of the upper cowl 11 at the rear edge having the notch 20 is determined to be smaller than the backward rising gradient β of the upper surface of the screen 21 at the front edge, and thus there is formed a shallow trough 22 between the upper surfaces 11a, 21a. As a consequent, as shown in Fig. 1 and Fig. 2, the backward extension A of the upper surface of the screen 21 passes near the apex of the helmet H of the rider R in a fully bent posture, and the backward extension B of the upper surface of the upper cowl 11 passes near the apex of the shoulder of the rider R in a fully bent posture.

[0017] As clearly shown in Fig. 2, a pair of left and right headlamps 23 are mounted on the front end portion of the upper cowl 11, and the front surfaces thereof is formed so as to continue to the front surface of the upper cowl 11.

[0018] In Fig. 3 to Fig. 5, a meter 25 is mounted on the vehicle body frame F for supporting the front fork 1 inside the upper cowl 11 and the screen 21 via a stay (not shown). In this case, the display surface 33 is faced in the upper rear direction and disposed vertically across the boundary B between the upper cowl 11 and the screen 21 in side view in order to increase visibility of the display surface 33 for the rider R even when the rider R takes the fully bent posture. The display surface 33 of the meter 25 is provided with a digital speed display 27, an analogue engine revolution display 28, and other various warning displays 29.

[0019] As is clearly shown in Fig. 5, the front half of the meter 25 is formed into a trapezoidal shape 25a the lateral width of which decreases toward the front, and the meter 25 is positioned in such a manner that a part or the entire portion of the trapezoidal portion 25a is positioned in the arcuate space 34 enclosed by the inner surface of the screen 21 and the straight line L passing between the left and right ends of the inner surface. A space for allowing the rotation of the top bridge 7 is defined between the meter 25 and the top bridge 7 for connecting the upper ends of the left and right legs 1a, 1a of the front fork 1.

[0020] Referring back to Fig. 1 and Fig. 2, a pair of mounting seats 30 are formed on the upper surface of the left and right side portions of the upper cowl 11, and the mirror stays 32 for supporting the back mirrors 31 are mounted thereon. However, the back mirrors 31 are to be removed when the motorcycle M participates in the race.

[0021] The action of this embodiment will be described below.

[0022] During travel of the motorcycle M, when the rider R takes a fully bent posture as shown in Fig. 1 and brings his helmet H closer to the rear edge of the screen 21, the upper cowl 11 having an upper surfacella formed into a convex shape with a relatively gentle backward rising gradient creates a satisfactory wedge effect with respect to the wind buffeted thereon during travel, and the wind streaming along the upper surface of the upper cowl 11 during travel passes near the apex of the shoulder of the rider R along the extension B, and thus wind drag may be reduced.

[0023] Since the convex upper surface 21a with a relatively steep backward rising gradient of the screen 21 has continuity with respect to the upper surface of the helmet H, the wind streaming on the upper surface 21a of the screen 21 rearward during travel may be transferred smoothly to the upper surface of the helmet H along the extension A without any significant turbulence,

and proceeds along the back of the rider R to the rear, which may also reduce wind drag. As a result, wind drag of the entire motorcycle M including the rider R effectively reduces, thereby increasing the maximum vehicle speed.

[0024] Since the display surface 33 of the meter 25 disposed inside the upper cowl 11 and the screen 21 is faced in the rising and arranged at the position vertically across the boundary B of the upper cowl 11 and the screen 21 in side view, the rider R can view the display surface 33 easily in the fully bent posture, and thus can know driving information such as a vehicle speed, engine revolutions, and the like accurately.

[0025] Especially, since the meter 25 is disposed in such a manner that a part or the entire portion of the trapezoidal portion 25a at the front half thereof is positioned in the arcuate space 34 inside the screen 21, even when a relatively large meter 25 with high visibility is employed, it can be disposed near the inner surface of the screen 21, and a space for allowing the rotation of the top bridge 7 of the front fork can easily be defined between the meter 25 and the top bridge 7 of the front fork.

[0026] The present invention is not limited to the aforementioned embodiment, and various modifications in design are possible without departing the scope of the invention. For example, the meter 25 may be supported by the front cowl 10 and secured indirectly to the vehicle body frame F.

The invention can be summarized as follows:

[0027] In a motorcycle, to increase the wedge effect of the upper cowl with respect to the wind buffeted thereto during travel and reduce wind drag while maintaining continuity of the upper surface of the screen with respect to the upper surface of the head of the rider in a fully bent posture, and to provide a meter with high visibility even for the rider in a fully bent posture.

[0028] In a motor cycle constructed in such a manner that the upper surface of the upper cowl 11 for covering the upper end portion of the front fork 1 is formed into a convex surface 11a with a backward rising gradient, a screen 21 having an upper surface formed into a convex shape21a with a backward rising gradient is mounted on the upper cowl around the periphery of the open-rear notch 20 for mounting the screen, and a meter 25 is disposed inside the upper cowl 11 and the screen 21, the backward rising gradient α of the upper surface of the upper cowl 11 at the rear edge is determined to be smaller than the backward rising gradient (3 of the upper surface of the screen 21 at the front edge, and the display surface 25a of the meter 25 is disposed vertically across the boundary B between the upper cowl 11 and the screen 21 in side view.

Claims

1. An arrangement structure of upper cowl, screen and meter for motorcycles, in which the upper surface of the upper cowl (11) for covering the upper end portion of the front fork (1) that supports the steering handle (3) is formed into a convex surface (11a) with a backward rising gradient, a screen (21) having an upper surface (21a) formed into a convex shape with a backward rising gradient is mounted on the upper cowl (11) around the periphery of the open-rear notch (20) for mounting the screen, and a meter (25) having a display surface (33) facing toward the back, upper side for being mounted on the vehicle body frame (F) is disposed inside the upper cowl (11) and the screen (21),

   characterized in that the backward rising gradient (α) of the upper surface of the upper cowl (11) at the rear edge having the notch (20) is determined to be smaller than the backward rising gradient (β) of the upper surface of the screen (21) at the front edge, and the display surface (33) of the meter (25) is disposed vertically across the boundary (B) between the upper cowl (11) and the screen (21) in side view.

2. , An arrangement structure of upper cowl, screen and meter for motorcycles according to Claim 1, **characterized in that** the meter (25) comprises a trapezoidal portion (25a) the lateral width of which decreases toward the front, and the meter (25) is disposed in such a manner that at least a part of the trapezoidal portion (25a) is positioned in an arcuate space (34) enclosed by the inner surface of the screen (21) and the straight line (L) passing between the left and right ends of the inner surface.

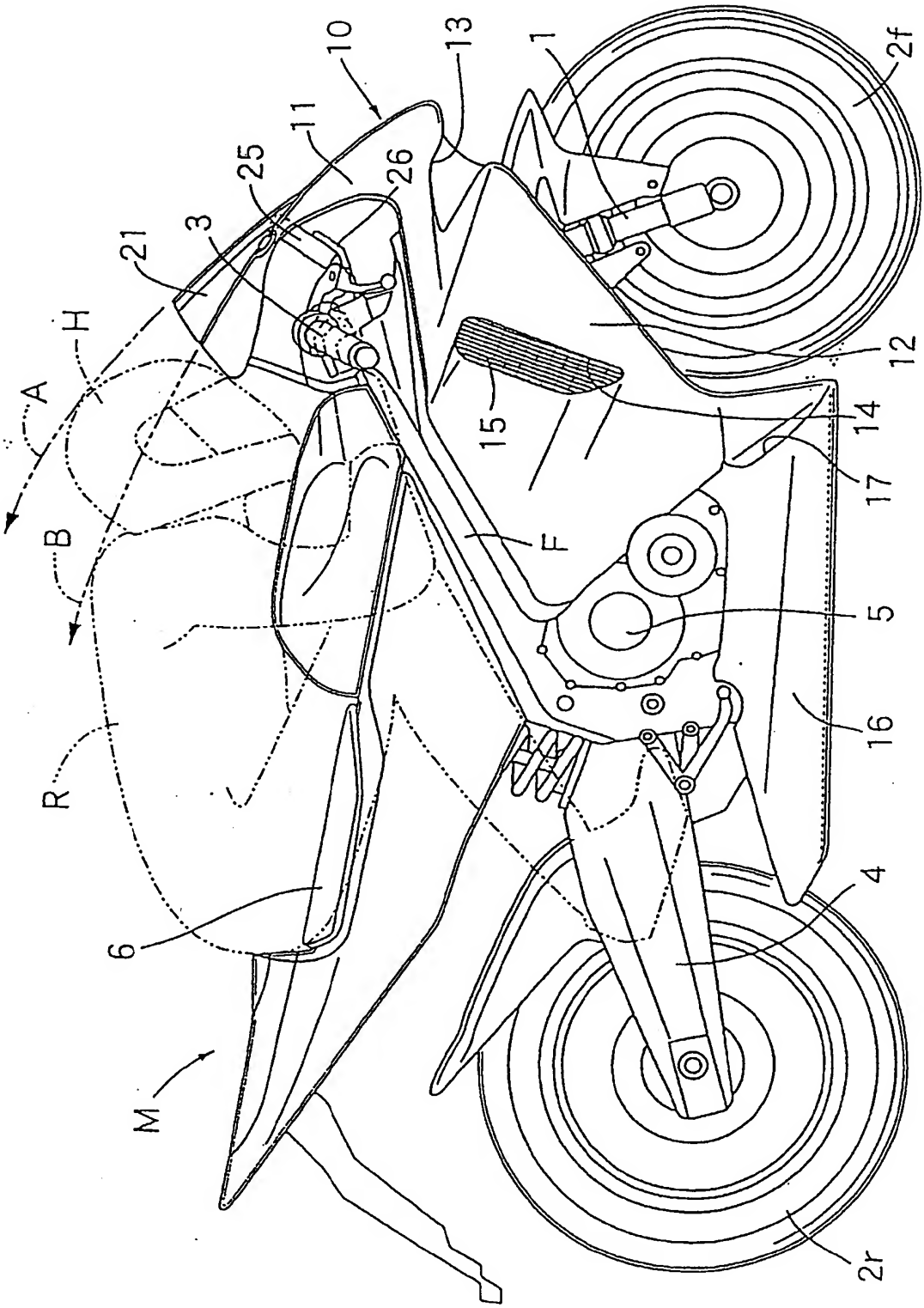

FIG. 1

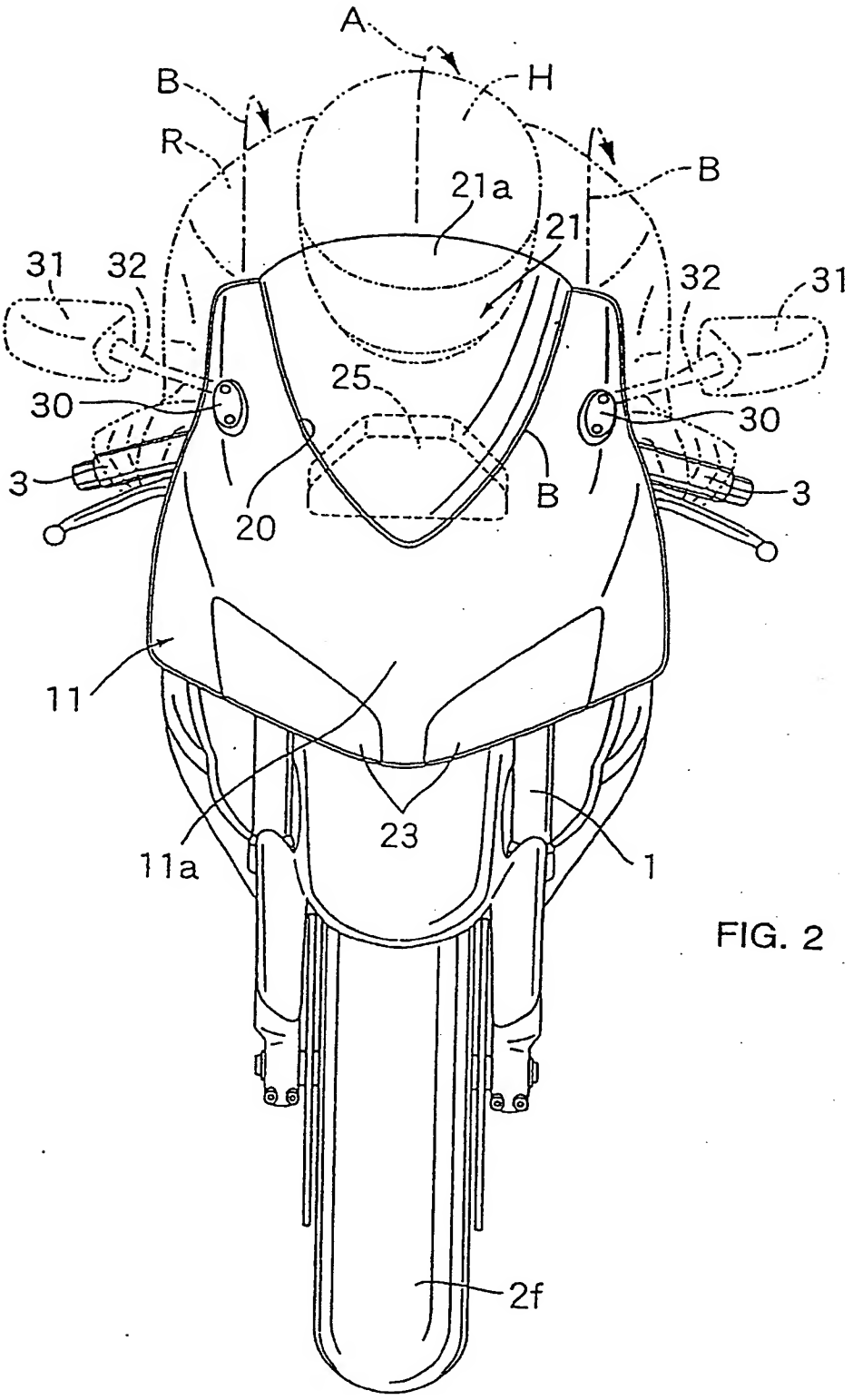

FIG. 2

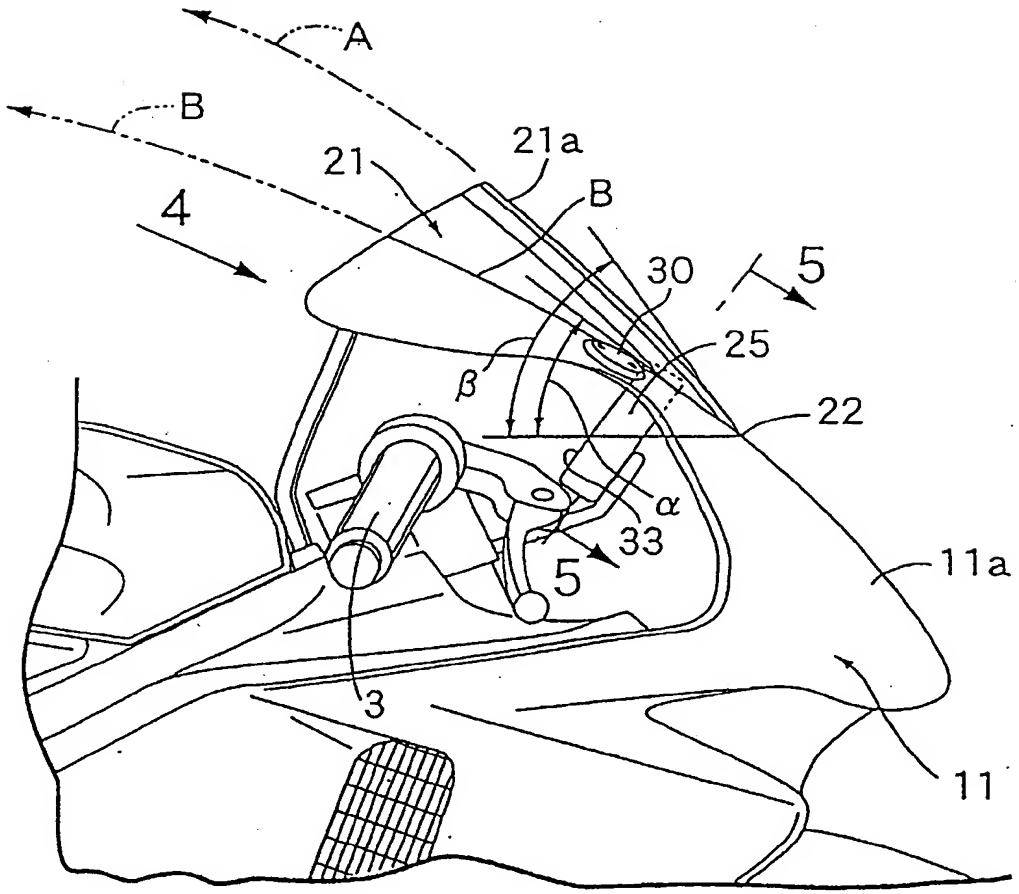

FIG. 3

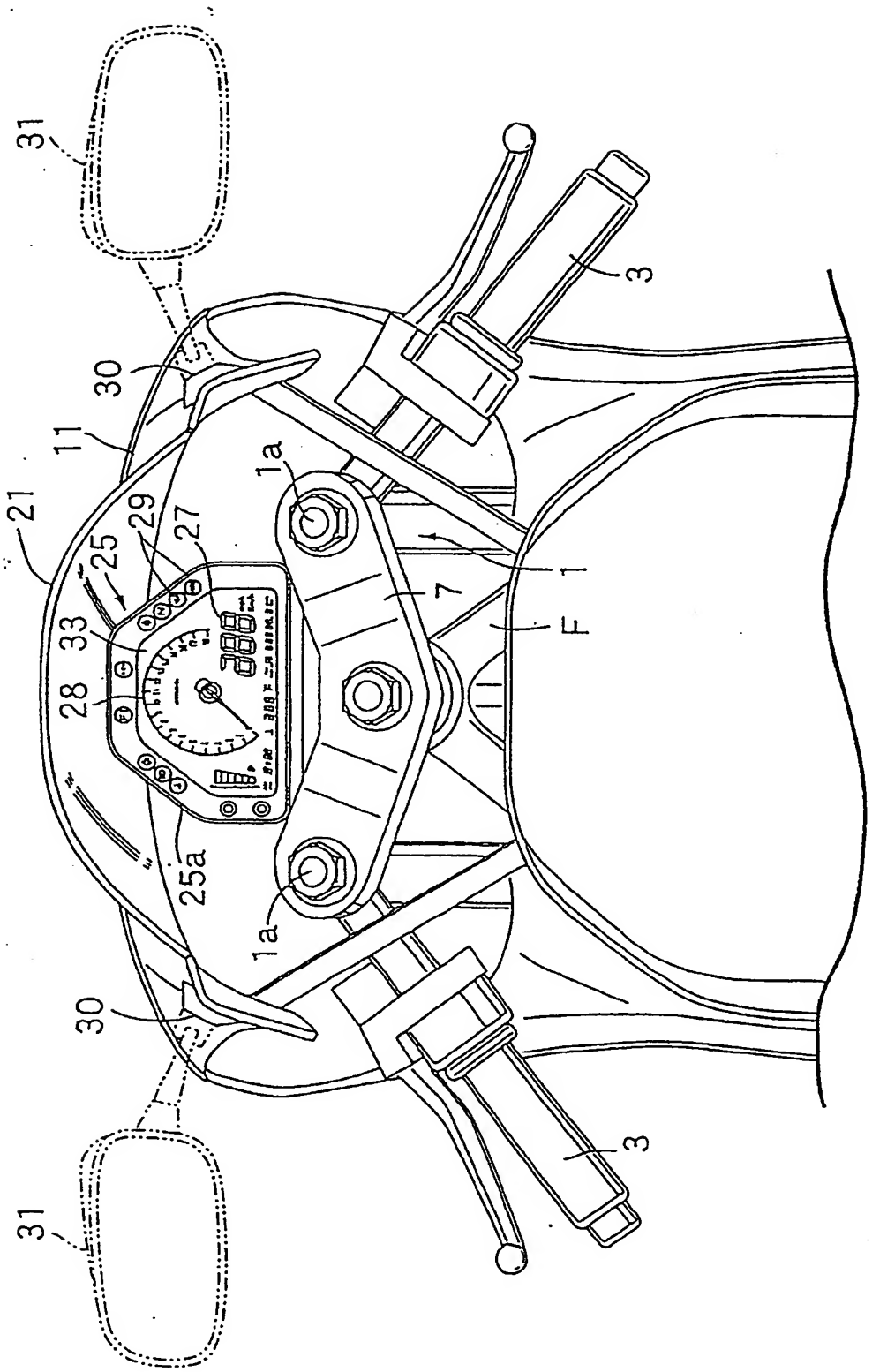

FIG. 4

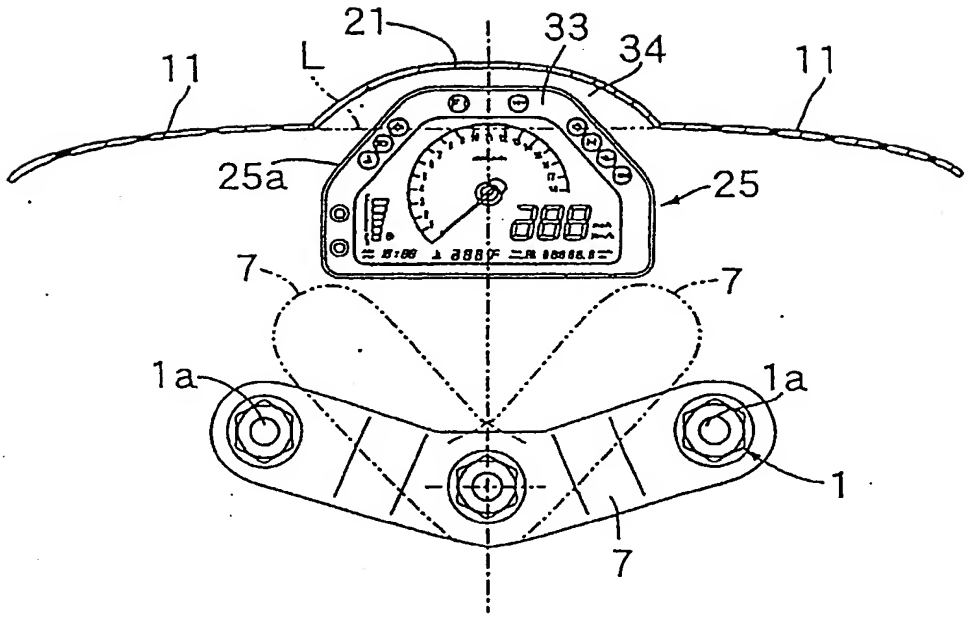

FIG. 5

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In a motor cycle constructed in such a manner that the upper surface of the upper cowl 11 for covering the upper end portion of the front fork 1 is formed into a convex surface 11a with a backward rising gradient, a screen 21 having an upper surface formed into a convex shape21a with a backward rising gradient is mounted on the upper cowl around the periphery of the open-rear notch 20 for mounting the screen, and a meter 25 is disposed inside the upper cowl 11 and the screen 21, the backward rising gradient α of the upper surface of the upper cowl 11 at the rear edge is determined to be smaller than the backward rising gradient β of the upper surface of the screen 21 at the front edge, and the display surface 25a of the meter 25 is disposed vertically across the boundary B between the upper cowl 11 and the screen 21 in side view.

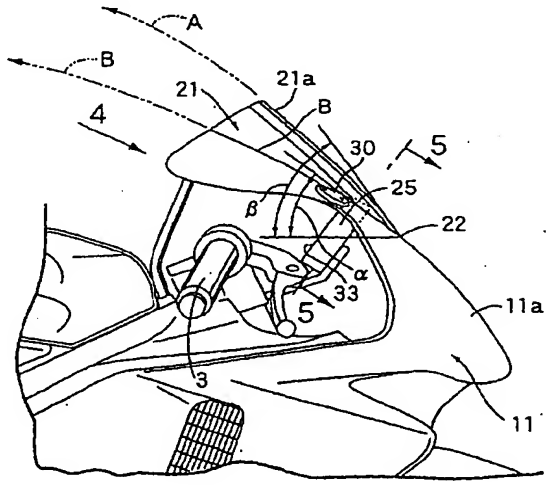

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 4 515 405 A (OGISHIMA TETSUO) 7 May 1985 (1985-05-07) * column 2, line 50 - column 3, line 36; figures *	1,2	B62J17/02
Y	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 19, 5 June 2001 (2001-06-05) -& JP 2001 048078 A (SUZUKI MOTOR CORP), 20 February 2001 (2001-02-20) * abstract *	1,2	
A,D	JP 63 032983 U (HONDA) 3 March 1988 (1988-03-03) * figures *	2	
A	DE 297 10 158 U (JF MOTORSPORT GMBH) 14 August 1997 (1997-08-14) * claims; figures *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 20, 10 July 2001 (2001-07-10) -& JP 2001 080561 A (YAMAHA MOTOR CO LTD), 27 March 2001 (2001-03-27) * abstract *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B62J
A	US 3 787 088 A (DREYER F) 22 January 1974 (1974-01-22) * figures *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 August 2003	Grunfeld, M

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4515405 A	07-05-1985	CA 1173808 A1	04-09-1984
		DE 3218774 A1	02-12-1982
		FR 2505765 A1	19-11-1982
		GB 2101546 A ,B	19-01-1983
JP 2001048078 A	20-02-2001	NONE	
JP 63032983 U		NONE	
DE 29710158 U	14-08-1997	DE 29710158 U1	14-08-1997
JP 2001080561 A	27-03-2001	NONE	
US 3787088 A	22-01-1974	NONE	

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